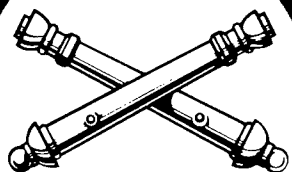


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HANDLE WITH CARE



FIELD ARTILLERY



Stopping Accidents in Field Artillery Battalions

Introduction



Developing leaders to fight and win on the modern battlefield is perhaps the greatest single challenge facing the military today. Army leaders are being challenged as never before to achieve peak readiness while safeguarding their soldiers and equipment.

In World War II, one out of every five American soldiers killed died as a result of an accident. In Korea, more than half the Army personnel hospitalized were injured in accidents. In Vietnam, accidents claimed more than 5,700 lives, disabled more than 106,000 soldiers, and produced nearly 5 million nondisabling injuries.

Each year, we kill the equivalent of a battalion of soldiers in accidents; we lose the equivalent of an entire field artillery brigade for more than 6 weeks due to accidental injury.

The \$300 million direct cost of 1 year's accident would put approximately 400 M109 Howitzers or 15 MLRS batteries in the field.

Today's equipment has inherent hazards; it is complex, expensive, and relatively easy to damage. Training hazards are less apparent and not instantly evident...and a single mistake by one soldier can produce a catastrophic accident.



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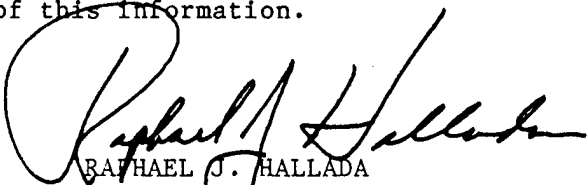
5 Apr 88

MEMORANDUM FOR: Commanders of All Field Artillery Units

SUBJECT: Safety in Artillery Operations

1. As the Chief of Field Artillery, I cannot overemphasize the importance safety plays in our everyday mission accomplishment. I therefore charge each of you to be aggressive and proactive in this most critical area.
2. Safety is an inherent responsibility of command and an essential element of good leadership. This responsibility cannot be delegated. Just as I am Fort Sill's safety officer, field artillery commanders at all levels are safety officers for their units.
3. Safety is a never ending job. Nothing we do justifies unnecessary risk of life, limb, or property. Our soldiers must be properly trained to always act safely. As leaders, we must think, plan, and teach safety. Our emphasis is essential to instill an appreciation of the importance of safety, both on and off duty. Every accidental loss detracts from the readiness posture of our soldiers and equipment.
4. The attached packet is a useful source of information to assist leaders in evaluating and upgrading their safety programs. It focuses on the leading causes of accidents in field artillery units and provides general counter-measures for each type accident. It also outlines risk-management techniques first-line leaders can use effectively to balance risk with operational objectives. I encourage the use of this information.

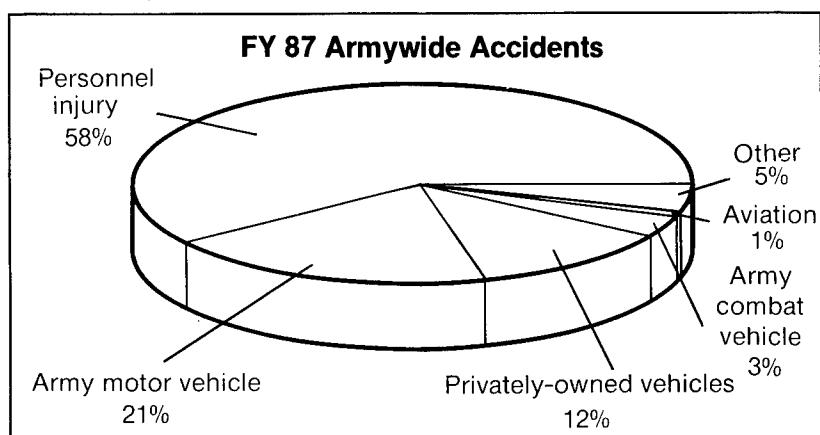
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RAPHAEL J. HALLADA
Major General, USA
Commanding

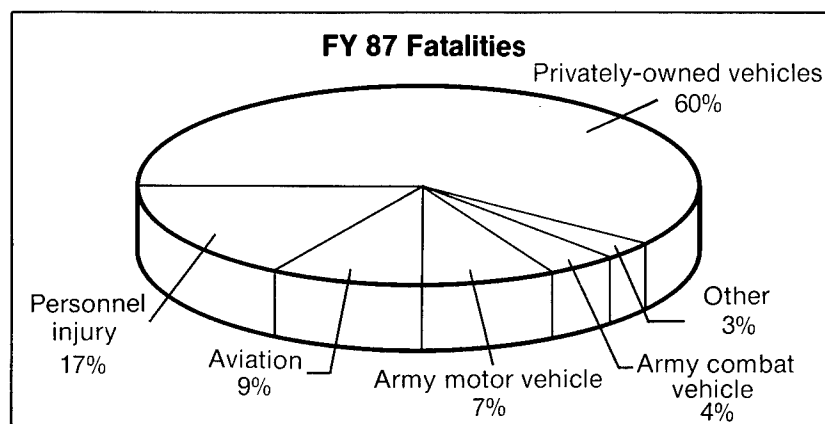
Stopping Accidents in Field Artillery Battalions

Field artillerymen have long recognized the inherent dangers of their trade and have developed safety practices to minimize the numbers of gunnery accidents. All commanders must continue to emphasize firing safety and the exacting procedures required to execute the art and science of fire support planning, gunnery tasks and crew drill.

Other areas injure our soldiers. An analysis of FY 87 Armywide accidents reveals that most of our reportable accidents occur as personnel injuries, as shown below:



More soldiers were killed in privately-owned vehicle accidents than in any other accident category.

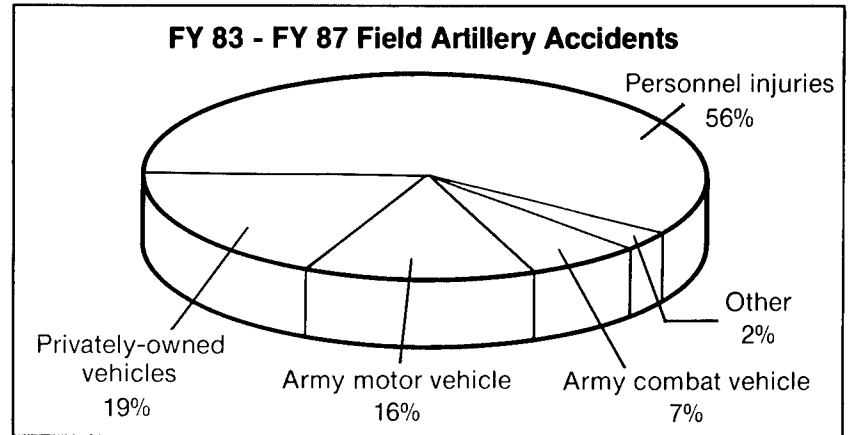


Saint Barbara watches over her artillerymen.

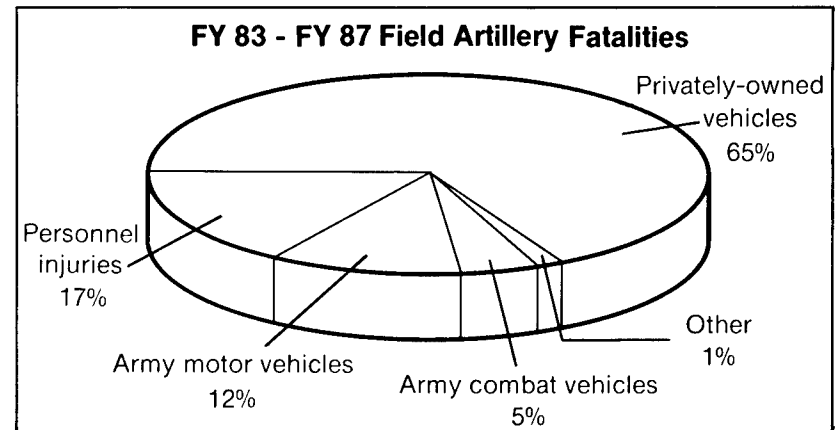


An analysis of FY 83-FY 87 accidents in field artillery battalions revealed that more than 97 percent of the accidents fall into **four** categories:

- personnel injuries
- privately-owned vehicles
- Army motor vehicles
- Army combat vehicles



And, like the entire Army, artillery soldiers are getting killed in privately-owned vehicle accidents.



Because artillerymen are paying strict attention to detail during firing operations and applying risk management techniques, less than 1 percent of injuries were caused by explosives or firing accidents. This same attention to detail applied to other activities causing accidents could yield tremendous dividends.

So what can commanders do about preventing these accidents while continuing to train realistically? If commanders could instill in their soldiers three minimum but effective characteristics, accident prevention problems would be a small shadow of what we face today.

- The first characteristic is **discipline**, the capacity to understand and accept the need for a set of rules and standards of conduct aimed at minimizing accident potential.

- The second is an **attitude** that accepts and respects responsibility for the safety of self, the safety of others, and the protection of property

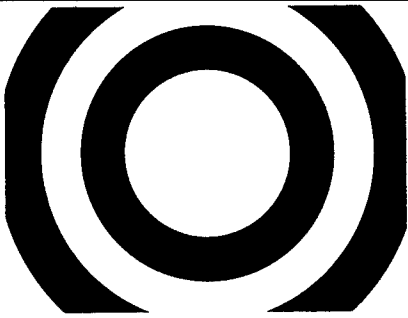
- The third is a "**sixth sense**" of safety, a keen awareness that spots accidents about to happen, a consciousness of the potential tragic results of unsafe acts on and off duty, and an appreciation of the value of protective equipment.

Proven "success factors" studies were made of battalion-sized organizations with good safety records to determine what factors contributed to their low accident rates. **Five factors** were common to all organizations studied:

- Performance criteria were precisely defined.
 - All personnel were acutely aware of the performance criteria.
 - Training was conducted to a high standard.
 - Immediate and effective action was taken to deal with any deviation from established performance criteria.
 - Operations were conducted by the book, and unit morale was high.
- In fact, in every safety study we've seen, where units were safe, troop morale was high.

The last factor is extremely important. **Unit members were proud of the fact that their organization conducted operations by the book.**




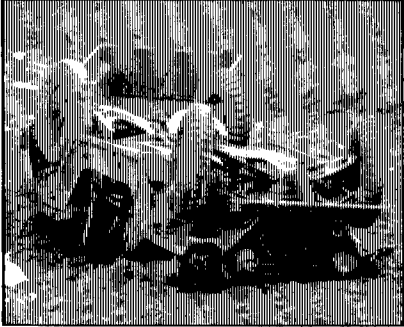



Target your actions for biggest payoff

Four accident categories kill and injure more soldiers than all other types of accidents combined. Improving safety in these key areas will give you the biggest payoff for your safety effort.

The following tables list the most frequent causes of accidents and command actions to be taken to improve safety in each category.

ACCIDENT CATEGORY	MOST FREQUENT CAUSES	ACTIONS TO TAKE
Privately-owned vehicles During a 3-day holiday, a soldier went home to see his family. He waited until late afternoon to start the 500 mile return to post and planned to drive all night to make formation the following morning. Fifty miles from post, he fell asleep at the wheel and swerved into oncoming traffic. In the head-on collision, he lost both his legs. The three occupants of the other vehicles lost their lives. 	Failure to use safety belts and helmets	<ul style="list-style-type: none"> • Enforce the requirement to use safety belts in vehicles and helmets while riding motorcycles on and off post, on and off duty. • Develop special privately-owned vehicle campaigns that encourage the use of safety belts and motorcycle helmets by soldiers and family members.
	Speeding	<ul style="list-style-type: none"> • Instill self-discipline in soldiers. • Create safe driving habits by enforcing speed limits in all military training activities on post.
	Drinking and driving	<ul style="list-style-type: none"> • Make troops aware of the career and legal consequences of the Army's tough policy on drinking and driving. • Deal firmly with each DUI offender. • Develop a year-round privately-owned vehicle accident prevention program targeted at drinking and driving. • Make pre-holiday safety briefings mandatory, and stress the life-threatening dangers of drinking and driving.
	Driver fatigue	<ul style="list-style-type: none"> • Encourage soldiers to avoid long trips during 3-day holiday weekends.
Army motor vehicle The ¼-ton jeep driver was towing a trailer. When he slowed down for a curve, the vehicle began to fishtail. The additional weight of the towed trailer spun the jeep around and off the road into the shoulder where it overturned, pinning the soldier underneath. The soldier did not anticipate the effect of loose gravel on the road surface and the additional weight of the vehicle trailer. This mistake cost him his life.	Undisciplined, untrained drivers	<ul style="list-style-type: none"> • Take corrective action at the first sign of a breakdown in driver discipline or disregard for established operating procedures. • Provide hands-on training in the environment in which drivers will operate their vehicles. • Plan driver training into the mission, not as a separate activity. • Whenever unit operations permit, pair an experienced driver with an inexperienced one to provide supervision and hands-on training. • Develop a program to ensure training includes seasonal and local driving hazards. • Hold drivers accountable for safe performance.
	Failure to follow operating procedures	<ul style="list-style-type: none"> • Require strict adherence to operating procedures. • Ensure all appropriate vehicle technical manuals are used.
	Speeding	<ul style="list-style-type: none"> • Establish and enforce safe speed limits for various road and weather conditions. • Instill self-discipline in soldiers.

ACCIDENT CATEGORY	MOST FREQUENT CAUSES	ACTIONS TO TAKE
Army motor vehicles 	Lack of supervision and control	<ul style="list-style-type: none"> • Ensure first-line supervisors strictly require and supervise drivers' preoperation checks. • Restrict dispatches when road or weather conditions are hazardous.
	Poor maintenance	<ul style="list-style-type: none"> • Require strict adherence to maintenance procedures. • Use mobile maintenance teams during FTXs so that damaged or improperly operating vehicles do not have to be driven. • Require special attention to brake components by maintenance personnel during periodic maintenance and by drivers during preoperation checks. • Prohibit operation of vehicles with defective brakes.
	Unsafe convoy operations	<ul style="list-style-type: none"> • Establish and enforce safe speed limits and following distances. • Convoy speed depends on road and traffic conditions. Generally, speed should not exceed 15 to 20 mph on long moves over rough roads; maximum catchup speed should not exceed 25 to 30 mph.
Personnel injury Combat soldiering activities <p>A soldier was erecting camouflage netting on his M577 at the battalion TOC. He slipped, fell, and suffered a broken shoulder. The other soldiers at the TOC worked extra hours to make up for his absence.</p> 	Command failure to take precautions for the operating environment	<ul style="list-style-type: none"> • Use risk management techniques to enhance safety in realistic training.
	Leader's lack of knowledge of personnel	<ul style="list-style-type: none"> • Know your people: their qualifications, training status, physical condition, and abilities.
	Failure to follow correct procedures for handling and operating weapons and using pyrotechnics and simulators	<ul style="list-style-type: none"> • Improve NCO supervision of soldier activities. • Ensure NCOs make on-the-spot corrections of unsafe acts and violations of procedures. • Ensure safety briefings include pyrotechnics and simulators.
	Soldier belief that safety requirements are suspended during training exercises to achieve tactical realism	<ul style="list-style-type: none"> • Eliminate this dangerous misconception through pre-exercise briefings that spell out the requirement for strict adherence to all safety procedures during all unit operations.

ACCIDENT CATEGORY	MOST FREQUENT CAUSES	ACTIONS TO TAKE
Personnel injury (continued) Maintenance, service, and repair activities <p>The left front tire had been removed, and the 2½-ton cargo truck was supported by a jackstand. The emergency brake was inoperative, so the truck was parked in gear. No chock blocks were under the rear wheels and the battery was not disconnected. A PFC was sitting under the vehicle next to the axle when another mechanic reached inside and started the engine to check the wiper system. The truck moved forward and fell off the jackstand onto the PFC. He died of his injuries.</p>	Failure to follow correct procedures	<ul style="list-style-type: none"> • Demand compliance with established work procedures even on routine tasks.
	Failure to use protective equipment	<ul style="list-style-type: none"> • Make sure protective equipment is worn on the job and include this requirement in SOPs.
	Misuse of tools and equipment	<ul style="list-style-type: none"> • Require the use of the right tool for every job. • Require personnel to keep work areas clean and tools in place.
	Inadequate inspections	<ul style="list-style-type: none"> • Ensure supervisors at all levels regularly conduct unscheduled spotchecks to be sure personnel are using correct, safe procedures. • Ensure preventive maintenance inspections are completed properly.
	Lack of supervision and insufficient command emphasis on safety	<ul style="list-style-type: none"> • Improve direct supervision of maintenance activities. • Ensure SOPs adequately describe procedures to be followed and cover safety aspects of all activities. • Hold personnel accountable for safe conduct on the job.
Sports <p>The soldier was playing unsupervised "scratch" football in the field between missions. While running after the ball carrier, his knee gave out on the uneven terrain. Six workdays were lost during a major training exercise.</p>	Lack of supervision	<ul style="list-style-type: none"> • Ensure that sports are supervised. • Train coaches and officials on sports safety. • Ensure that playing facilities meet mandatory requirements.
Army combat vehicles <p>The soldier, using ground guides, was positioning an M548 into back-to-back configuration with an M109A3. He stopped the M548 about 6 feet from the howitzer and placed the vehicle in neutral. However, the range cover indicator had slipped and the vehicle was in reverse. The soldier pulled the throttle control instead of the engine cutoff, propelling the vehicle into the back of the howitzer. The section chief was fatally crushed between the two vehicles. The soldier was not the assigned driver and had not operated an M548 in more than 8 months.</p>	Failure to follow correct procedures	<ul style="list-style-type: none"> • Enforce the use of correct procedures by crews and maintenance personnel. • Promptly correct unsafe acts and disregard of established procedures. • Prohibit nose-to-nose slave starting. • Require crews and passengers to wear protective headgear at all times.
	Driving too fast for conditions	<ul style="list-style-type: none"> • Establish and enforce safe speed limits for various road and weather conditions.
	Following too closely	<ul style="list-style-type: none"> • Before each convoy, brief drivers on safe-to-follow distances and night and foggy conditions.
	Fatigue	<ul style="list-style-type: none"> • Anticipate errors caused by fatigue. Increase supervision during extended training periods to ensure troops do not shortcut procedures and safety precautions due to fatigue. • Establish and enforce a unit crew rest policy.

ACCIDENT CATEGORY	MOST FREQUENT CAUSES	ACTIONS TO TAKE
Army combat vehicles The soldier fell asleep next to his M270 armored vehicle mounted rocket launcher. The section chief drove the launcher to a POL tanker for refueling. Later, he backed the launcher into its original position. The M270 crushed the sleeping soldier's skull. The section chief did not use ground guides.	Inadequate driver training	<ul style="list-style-type: none"> • Allow only properly trained and licensed drivers to operate tracked vehicles. • Match the driver to the mission. • During training, expose drivers to all the conditions under which they will be expected to operate.
	Improper use of ground guides	<ul style="list-style-type: none"> • Strictly enforce the requirement to use ground guides and ensure they follow correct procedures.
	Hatch covers	<ul style="list-style-type: none"> • Make sure the safety latch modification has been installed on all your tracked vehicles. Then require crews to insert the safety pin every time the vehicle is driven with the hatch cover open.
	Lack of supervision	<ul style="list-style-type: none"> • Improve direct supervision of maintenance. • Ensure preventive maintenance checks and inspections are made.

"Leaders must instill in their people a strong sense of individual responsibility for safety in training, in working, and in living."

Gen. Carl E. Vuono, Army Chief of Staff

"Tough, realistic, safe, go to war training is our top priority."

CSM Julius W. Gates, Sergeant Major of the Army